CRITICAL NOTES ON SOME SPECIES OF MYMARIDÆ FROM THE SANDWICH (HAWAIIAN) ISLANDS, WITH COMPARATIVE NOTES ON AUSTRALIAN, NORTH AMERICAN, AND EUROPEAN FORMS.

(Hymenoptera; Chalcidoidea.)

By A. A. Girault.

I have recently obtained a few specimens of Mymaridæ from the Sandwich Islands through the kindness of Mr. Otto H. Swezey, all of the genus *Polynema* Haliday; also I have captured in Northern Queenlsand and in Fiji one or two species of the family common also to these islands and in one case to North America. The Myrmaridæ of Australia also, now, are tolerably well known to me. Inasmuch as the Sandwich Islands are situated in a position geographically between North America, Fiji, and Australia, it is interesting from the standpoint of geographical distribution of animals to make this comparison, since it will be shown as probable that most of the indigenous forms of the family occurring in Hawaii, North America, and Australia (also Europe) are quite peculiar to those continents, fulfilling our expectations. It is also shown probable that such species as are common to several of the continents or islands have been distributed through commerce or else are parasitic upon widely distributed species or genera or families of insects. I make the detailed comparisons herewith.

Subfamily GONATOCERINÆ.

Genus ALAPTUS Haliday.

1. Alaptus immaturus Perkins.

Perkins described this species in 1905 from Bundaberg, Queensland, Australia, it having been reared from leaves of sugar cane infested with leaf-hopper eggs, but these latter were doubtfully the host. In the second volume (part VI) of the Fauna Hawaiiensis, Cambridge, England (1910, p. 661), the same author records the species from the Sandwich Islands, "Oahu and probably all the islands; bred from the eggs of Psocidæ." But previously, also in the introduction to the bulletin containing the original description of the insect, on page xxiv, it was stated in regard to its host: "Eggs of Psocid feeding on fungus growing on honeydew excreted by leaf-hoppers." Thus, the doubtful host implied in the original description was given by mistake, probably, and the host is a psocid, as would be expected. Since, I have captured the species in several localities in North Queensland, once from the foliage

[1] Contribution No. 2, Entomological Laboratory, Sugar Experiment Stations, Mackay, Queensland.

of citron growing wild near the jungle, but which was imported and planted by a settler some years ago. I have compared the species with others of the genus in a paper on Australian Mymaridæ now in manuscript and it should suffice to say that it is a good species, but a typical one of the genus, there being no peculiarities which may be connected in any way with its habitat.

The occurrence of this species in the Sandwich Islands would appear rather remarkable to me did I not have reason to think that it was introduced there with the other Australian parasites of sugar-cane insects, as described in Bulletin No. 1 of the Hawaiian Sugar Planters' Association. No direct statement is made to that effect, but it seems very probable. If it was not intentionally introduced, then its presence can be explained by the fact that it is associated with commercial plants such as sugar cane and citrus fruits and was distributed by commerce. These explanations are the most likely and reasonable ones, for otherwise we would have to accept others which in this case would be not incredible, but less reasonable in the face of the first two. The species most probably is native to the east coast of Australia.

2. Alaptus globosicornis Girault.

This species was described from Florida in North America. It was recorded to have been reared from a coccid on citrus fruits in 1907. About three years later Girault recorded it from Honolulu, in the Sandwich Islands, where it had been captured in an office as early as 1900. It was thus found earlier in the Pacific than in North America. Late in 1911 and early in 1912 I captured a number of specimens of it in North Queensland, where it appears to be the commonest species of the genus, but forms what appears to be a distant color variety; the Hawaiian specimen also appears to be a similarly distinct variety. In Queensland the species was found only in settled areas where citrus fruits are not uncommon; in the Sandwich Islands the office where the species was captured was very probably an insectary or an entomological or quarantine office where imported insects and trees would likely be placed for a time. Thus, again, I think the explanation of the wide distribution of this species is that of commercial dispersal, the parasite being carried along with its host. This seems the most likely. The fact that the species is split into geographical varieties would tend to show that it has been distributed over its present-known range for some time, but a variation of this kind, namely, of general body coloration, does not necessarily have to have a long period of time for its consummation, but, I believe it is known, may ensue after the exposure of a comparatively small number of generations to the new climate. The species is a characteristic one, because of the submoniliform

antennal funicle, but it is as peculiar in its relation to North America and European species as it is to those of Australia.

Genus LEIMACIS Foerster.

A species of this genus (*peregrina* Perkins) has been described from Honolulu and I have an Australian species captured in North Queensland; the two species are distinct, since they differ in general coloration and markedly in the ciliation of the fore-wing and length of the antennal club.

Subfamily MYMARINÆ.

Genus ANAGRUS Haliday.

1. Anagrus armatus (Ashmead).

In my paper on Austrialian Mymaridæ, mentioned previously, I will give evidence that this species is common to North America, the Sandwich Islands, the Fijian Islands, and to Australia. The matter need not be gone into here, but I desire merely to account for its occurrence in these widely separated countries. The species was first described from Florida in North America, more than twenty years ago. Recently, I showed that it was very common in North America, and the evidence which I will present in the paper referred to shows that it is distributed from the east coast of the United States as far west as the Rocky Mountains and is parasitic upon leaf-hopper eggs deposited in the soft parts of various plants, those recorded being the grape and apple (both inferred, since the parasites appeared from twigs of those plants infested with external hosts which are very doubtful hosts of this parasite), an economic *Empoasca* (a definite, unpublished record from host egg in leaves) and from a *Liburnia* on grass; also Perkins records it from *Liburnia* or similar eggs in Australia, the plant doubtless sugar cane, another grass, but no statement is made that it was originally found on that plant. However, Perkins had discussed the parasite as an associate of the sugar cane and introduced it into the Sandwich Islands for the purposes of the economic entomology of that crop.

The above facts, namely, that the species occurs in four widely separated countries and that it is associated with cultivated plants widely transported in commerce, represent effect and cause, since I believe that little or no doubt can be entertained otherwise. The opportunities for the distribution of this insect during the last century from one continent to another by commerce have been enormous, for what plants have been more widely interchanged than the grasses and fruits? There is nothing to contradict this view. This species, also, is very similar to, yet dis-

tinct from, *brocheri* Schulz of Europe. In this connection, Perkins has stated: "*Anagrus* of the Mymaridæ attacks the eggs of the Delphacidæ alike in Europe, America, Australia, Fiji, and China, and even the species hardly differ in these countries."

Subgenus PARANAGRUS Perkins.

1. Paranagrus perforator Perkins.

This species was described from Fiji. It was obtained from the eggs of various genera of delphacid leaf-hoppers, usually in grasses, rarely in sugar cane, and was introduced into the Sandwich Islands in connection with the economic entomology of sugar cane. Its occurrence in those islands is thus accounted for, but just recently I have captured several specimens of it in North Queensland in an area planted with sugar cane and I have no doubt that its presence here is due to introduction with that plant; more than this, however, it may be the same species as *Paranagrus optabilis* Perkins described from Queensland, since the two forms are very much alike, and according to Perkins *optabilis* also occurs in Fiji. The two forms differ only in the presence of an exserted ovipositor in one (*perforator*) "for a length equal to that of all the joints of one of the hind tarsi taken together." But my Queensland specimens of *perforator* have the valves of the ovipositor exserted to an extent somewhat less than that described originally. Both specimens are connected with sugar cane.

Genus POLYNEMA Haliday.

1. Polynema reduvioli Perkins.

Of interest generically because of the lengthened proximal joint of the antennal funicle, this species was described from the Sandwich or Hawaiian Islands, it being parasitic upon leaf-hopper eggs in the leaves of sugar cane. Subsequently, it has been recorded from several islands of the Sandwich group. Mr. Swezey has sent me several specimens of it and I examine them herewith, with special reference to the relations of the species to North American, European and Australian species. As was to be expected, the species is closely related to those species like the type of *Stephanodes* Enock, *Polynema enockii* Girault, *Polynema psecas* Girault—and the lengthened proximal joint of the antennal funicle is correlated in all with the peculiarly broad fore wings bearing very fine discal ciliation and the intense coloration of the yellow part of the body; also the serrated scape. I am the more inclined, since seeing this species, to recognize Enock's *Stephanodes* with at least the rank of a subgenus, but await, before considering this, the comparison of the three and with an Australian form. I still hold back, also, because of the species *bifasciatipenne* Girault,

which has no correlated color nor fore wings, but is peculiar to itself.

At first I take the European species with lengthened proximal funicle joint—(*Stephanodes*) *Polynema enockii* (Girault). The females differ as follows: Funicle joints 4 and 5 are shorter and subequal in *reduvioli* and joint 5 is not nearly as long as joint 3 but distinctly shorter; also the fore wings are not quite so large, more graceful, bearing about 25 lines of fine discal ciliation; otherwise, I can not distinguish the two species; they are remarkably similar; the antennal scape in *reduvioli* bears the peculiar sculpture. The males of *enockii* differ from the males of *reduvioli* in having distinctly longer joints in the flagellum. The coloration of both species is the same. In regard to the North American *psecas*, the Hawaiian species, comparing the females first, differ thus: Only in the fact that the second funicle joint is shorter in relation to the first in the North American species, but in the same species I have seen a specimen where the two joints were subequal; this difference is certainly very small and it is extremely difficult to know what to do in such cases. By comparing the males, it is seen that they differ as in the case of *enockii*, the flagellar joints in *psecas* being distinctly longer. For the present, therefore, I leave the species separate, though they form suspicious units. In one specimen of *psecas*, the second funicle joint was yellow like the first.

On November 4, 1911, I captured a single female *Polynema* from a window around the veranda of a private residence at Kuranda, North Queensland, a locality a few miles distant from the nearest sugar-cane area. This species bore a long proximal funicle joint of the antenna and as expected closely resembled the foregoing species. I now compare it with them. It resembles all but more nearly *enockii* and *reduvioli*, differing from the former in bearing fore wings like the latter; thus, as concerns the antennæ, it is intermediate or nearly between *reduvioli* and *psecas*. From the Hawaiian species I am unable to separate it, so that the species is common to the Sandwich Islands and Australia. From what Perkins states in the original description of his species (*reduvioli*) I have not much doubt but what it is the same as *hawaiiensis* of Ashmead. In the Australian specimen of *reduvioli*, the proximal funicle joint was shorter than usual, but there seems to be considerable variation in this respect, as I have experienced with *psecas*. Hence, the English species is the most distinct, while the North American and Hawaiian forms are very closely allied if not the same.

Here we have specimens of at least two distinct species of *Polynema*, and probably three, occupying an enormous area of the

earth and occurring in very distant countries with greatly different climates; and the two or three are strikingly alike. The climate of North America is vastly different from that of Hawaii or North Queensland, and yet we find forms occurring in all three places that are so much alike as doubtfully representing two species. As concerns the occurrence of the Hawaiian form in Northeast Australia, the explanation again hinges upon commercial distribution, since the species is associated with sugarcane insects in Queensland and the Sandwich Islands. Commerce seems to be accomplishing in a few years what nature takes thousands to do.

I believe it is true in all genera that their species will be found to be more or less clustered in groups, and this seems to be necessary from their nature and the manner of their formation. These clusters of species must be viewed as genera in the making and although it must be conceded that natural genera occur, since it is allowed that species are natural, still from the standpoint of human experience and reason it is extremely difficult to say just where a genus commences and a cluster of allied species ends, just as it is difficult to say when a variety is a species. So we find it in this mymarid genus *Polynema*. There are species grouped according to the width of the fore wings, as *longipes* and its allies and the closely allied group of species including *consobrinum*, *striaticorne*, *regina*, and *euchariforme*. Enock separated one species characterized by a long proximal funicle joint in the antennæ as the distinct genus *Stephanodes;* subsequently other species were found bearing the same character, two or three of them much alike in coloration, the structure of the fore wings, and other appendages and agreeing also in bearing a peculiar sculpture on the scape. But one of them is totally different in the structure of the fore wings and in coloration, and in still other species the peculiar sculpture of the scape occurs without the other correlated characters. This species group seems to be more on the way toward forming a genus, but since it is difficult to say just what the characteristics of the genus will be if the group is raised to that rank, it seems best not to accept the genus. If the long proximal funicle joint is taken as the separating characteristic, with what is it correlated and how long it is necessary for it to be, the species *striaticorne* and *bifasciatipenne* form connecting links between the forms bearing a short proximal funicle joint and those bearing a long one, and although these species have the sculptured scape (only rarely in *striaticorne*), but totally different wings and color, where is the correlation demanded. There are no other characters available as a basis for separation.

The above comparative notes are based upon these specimens: *Polynema enockii* Girault—one male, one female mounted in

balsam, labeled "Burnham Beeches, Eng. 2.6.08, 23.7.08 (male); C. Waterhouse. *Polynema psecas* Girault—Three females (from Illinois, U. S. A., Urbana, April 22, 1909, J. D. Hood; Mattoon, July 16, 1910; from United States National Museum collection, no labels); one male, Mattoon, Illinois, U. S. A., July 16, 1910. *Polynema reduvioli* Perkins—two males, one female remounted from cards in xylol balsam, received from Mr. O. H. Swezey and labeled "Honolulu, Oahu, 7.22.07," males, and "Pahala, Hawaii, 12.2.05," the female. Also a female captured in North Queensland as above noted.

2. Polynema rubriventre Perkins.

Mr. Swezey sent me two females of this species collected December 5, 1907 (12–5–07) at Kaumuchona, Oahu, Sandwich Islands, by himself. The specimens were mounted on cards. In order to remount them, these latter were removed from the pin and placed into a vial containing ordinary water. After a short while they had become dissolved from the cards and by gently shaking the vial were made to float freely upon the water. With a camel's-hair brush they were removed and placed upon a slide, upon which, after draining them, they were run through absolute alcohol and chloroform in succession, draining after each operation. Then being floated in chloroform, they were without difficulty removed to a central drop of xylol-balsam, merely by transferring them on the end of an insect pin dipped into the balsam; the balsam was then covered with a cover-glass. Gentle heat was then applied, placing the cover in its place and removing air and the mount was complete. This operation has been described because of the ease and rapidity with which it is performed and also because the mounts are sufficient for the purposes for which intended and no injury is done to the specimens.

Perkins described this species from Oahu from an elevation of 1,500 feet and upward. It is not known to occur elsewhere than Oahu. Its original description agrees with the specimens before me. The characteristic black of the head and thorax and the ferruginous of the abdomen contrast; the legs are intense orange yellow; the valves of the ovipositor are exserted for a distance equal to the length of the distal funicle joint or about somewhat less than a fifth of the length of the abdomen and they are concolorous with the abdomen. The species is a large one, robust, with broad fore wings whose discal ciliation is dense and moderately long, not fine. The longest marginal cilia are only about a fourth the wings' greatest width; the fore wings are somewhat larger than those in the *sibylla* Girault and has distinctly shorter marginal cilia; the fore wings also are distinctly fumated along the distal half of that portion of the blade which is distad of the venation

especially centrally or in the midlongitudinal line; the second funicle joint is the longest joint of the funicle, the third joint also long, twice the length of the moderately slender first joint, which is slightly longer than the pedicel. The distal three joints are all distinctly longer than the proximal joint and all subequal; the scape is not sculptured nor asperate; the club is rather short, stout, ellipsoidal. Marginal vein broad and short. Posterior wings without noticeable midlongitudinal discal ciliation, their cephalic marginal cilia somewhat longer than usual, bearing two lines of discal ciliation along each margin. The species is distinct from any which I have seen, though its fore wings are somewhat like those of the North American *sibylla* and perhaps somewhat like the English *flavipes*, but not much. I have seen no Australian species like it, but I have only two species of the genus which are new species and which appear to be indigenous. The male has never been described.

3. Polynema terrestre Perkins.

Described also fom Oahu, Sandwich Islands. This is an enormous species of the genus, being noticeably more robust than the preceding species, *rubriventris*. Mr. Swezey sent me a pair mounted on cards, together with another male of the species mentioned below (*poeta* n. sp.) which was mixed in. The specimens were labeled "*Polynema terrestris* Perkins. Oahu, Kaumuchona, ♀, 12.5.07; Olympus, ♂, 11.21.09. O. H. S." Both specimens were from the island of Oahu.

The original description agrees with the specimens, excepting with the latter the tibiæ of all of the legs and the scape were more or less brown or dusky, the distal funicle joint (and the two preceding ones also) in the female distinctly more than thrice its width, at least five times longer than wide, the club distinctly less than the combined length of the two preceding joints; also, the longest marginal cilia of the fore-wings are distinctly less than half the greatest width of the large fore wings, not more than between a third and fourth as long as the wing is wide. The scape is without sculpture; funicle joints all moderately long, the second very long. The fore wings have a smoky line across them at the marginal vein; the latter is rather long. The fore wings are broad and large, larger than in *rubriventre*, their discal ciliation fine and dense, somewhat as is *reduvioli*, each cilium, however, rather long. The tarsi are noticeably clothed with stiff, short bristles. The cephalic marginal cilia of the posterior wings is distinctly longer than the blade is wide and at tip the blade bears several confused lines of discal ciliation in the midlongitudinal line. The original description of this species is certainly not very explicit and is nearly the same as for the species *gigas*. For all

one may know to the contrary *gigas* may be the same as *terrestris*, since all that we know about it is that the legs are more or less brownish or yellowish. Now species of the genus may easily vary that much, that is, from yellow to brown in the legs and basal antennal joints, and making species on such differences is hazardous, to say the least. Because of such tendency to vary, the descriptions become all the more obscure.

This species differs from any other species known to me, mostly in its enormous size, its large fore wings, which bear almost forty lines of discal ciliation across the wides point, and the long antennal joint, especially the second and third joints of the funicle. It is distinctly larger than *Cosmocomoidea morrilli* Howard, which is a large species for the family. The fore wings are much broader than those of the North American *graculus* and *sibylla*. From the European *flavipes* it differs again in its robustness in body and appendages. The joints of the flagellum in male *terrestris* shorten distad, but the proximal joint is somewhat shorter than the second joint, which is at least six times longer than broad. The shortening becomes noticeable as funicle joint 8. Joints finely striate.

The other male, which as stated was sent with *terrestre* as a specimen of that species, is quite distinct and appears to be undescribed. This case again illustrates how the members of this genus may be alike in color, yet different in structure, and also how careful we must be in dealing with these systematically difficult insects. I describe the species herewith.

4. Polynema poeta new species.

Male.—The same as *terrestre* male, excepting as follows: Decidedly smaller, slightly smaller than *rubriventre* but still large for the genus, measuring about 1.40 mm. The pedicel, scape, abdominal petiole and all of legs except the black distal tarsal joints, chrome yellow, the convex margin of the scape asperate slightly. Joints of the tarsi and of the flagellum all somewhat shorter than in *terrestre*. The fore wings are entirely different, except in the marginal vein. Thus, they are noticeably narrower though of the same shape, while the discal ciliation is coarser and less dense (only about twenty-six lines across the widest portion of the blade), the longest marginal cilia about slightly over a third of the fore wing's greatest width. The thorax apparently without sculpture, the parapsidal furrows distinct, curved, a transverse line of foveæ across the apex of the scutellum, near the margin. Joints of antennal funicle where longest (joints 2–5) at least six or more times longer than wide, the second somewhat longer than the first, which is subequal to joint 6; 7 somewhat shorter than 1, while joints 8–11 are subequal and only about four times longer than wide. The joints are longitudinally striate.

From a single specimen, 2–3 inch objective, 1–inch optic. Bausch & Lomb.

Female.—Not known.

Described from a single male specimen received from Mr. O. H. Swezey as above noted. The species is characterized by the shape, size and ciliation of the fore wings, which are broader than in most species of the genus, resembling those of *sibylla*, nearly, though the marginal cilia in that species are longer.

Habitat: Sandwich Islands—Oahu (Olympus).

Type: Cat. No. 15251, U. S. National Museum, Washington, D. C., the above male (mounted on a slide with a pair of *Polynema terrestre* Perkins).

5. Polynema tantalea Perkins.

The fourth species received from Mr. Swezey is native to the Sandwich Islands and was described form Oahu. It is a large species, but not so large as *terrestre*, to the naked eye appearing intermediate between that species and *rubriventre*. It is characterized as far as other species known to me are concerned by its ferruginous color and clear fore wings, the head black (sometimes in balsam having a metallic greenish tinge, though I doubt the realness of that) and the distal five antennal joints, the distal tarsal joint. I was sent two specimens, but they represent two apparent species, neither of which agree with the description of *tantalea*. A male specimen agrees, however, excepting that the abdomen is black only at tip. Here again is a case where it is impossible to identify with certainty the specimens from the descriptions, since no comparative descriptive notes are given for the species, more especially in regard to the fore wings in which these two species differ. I shall thus consider the male specimen as *tantalea*, since it agrees nearly with the description of that species (its abdomen is obscurely dusky nearly to base, black at tip); the female, however, appears to be undescribed; it differs from *apicalis* in having the third and fourth antennal joints yellow and the wings hyaline, from *perforator* presumably in bearing a shorter club, a shorter proximal funicle joint, shorter marginal cilia of the fore wing, and the yellow third and fourth antennal joints; and from *oahuensis*, a third similar species described by Perkins from Hawaii, in having the four distal joints of the antennæ black, the head all black and shorter marginal cilia of the fore wing. As regards *tantalea* as represented by the male specimen, it differs in having the fore wings less broad, the discal ciliation denser but of about the same quality; thus, the *tantalea* bears about thirty-four lines of the cilia across the widest blade portion, while the other bears about thirty denser lines. The difference is noticeable, but without more material I merely designate this

female specimen as a narrow-winged variety of *tantalea*. I do this with some diffidence, realizing the difficulties, but at the same time remembering that it is the business of systematic entomology to detect these differences and record and interpret them. The male specimen of *tantalea* has the distal joint of the flagellum somewhat shorter than the proximal funicle joint; the joints are finely, longitudinally striate; the line of foveæ on the scutellum is composed of two obliqued straight lines on each side of the meson, meeting at the meson. The line appears to be a broad, convex curve in the variety. In *tantalea* the length of the longest marginal cilia of the fore wing is equal to about a fourth of the wing's greatest width. The caudal marginal cilia of the posterior wing are very long, longer than the longest cilia of the fore wing. The forewings are broader than those of the North American *sibylla*, with shorter marginal fringes.

Polynema tantalea longipenne, new variety.

Female.—Ferruginous, the distal five antennal joints, the distal tarsal joint, the intermediate and posterior tibiæ, the basal portions of the cephalic tibiæ, the marginal vein, and the head black or blackish. Funicle joints 1 and 2 suffused with dusky. Fore wings slightly stained at the distal half of that portion of the blade distad of the venation. Proximal funicle joint subequal in length to the pedicel, not quite half the length of the second joint, which is a fourth longer than the third; funicle joints 4, 5, and 6 subequal, each a fourth shorter than the third and distinctly longer than the first, the club not quite equal in length to the two preceding joints combined. Fore wings nearly as in *Polynema sibylla*, but the marginal cilia are shorter.

Like *tantalea*, except as noted above in regard to its fore wings and probably the foveate line across the scutellum.

Described from a single female specimen received from Mr. Swezey and labeled "*Polynema tantalea* Perkins, Kaumuchona, Oahu, 12.5.07. O. H. S."

Habitat: Sandwich Islands, Oahu (Kaumuchona.)

Type: Cat. No. 15252, U. S. National Museum, Washington, D. C., one female in xylol-balsam (mounted with a male specimen of *tantalea*).

The foregoing male of *tantalea* was collected by Mr. Swezey at Tantalus, Oahu, October 15, 1911.

Thus we have seen four common species of *Polynema* indigenous to Hawaii which are distinct from native North American and Australian species of the genus, so far as is known; also from native European species of the genus so far as my limited knowledge of these latter goes. Also, it has been shown that there is a relation between the species so far known to exist in several continents

and the presence of commercial crop plants with which they have become associated. These facts bear out the conclusion long reached by naturalists that these widely distributed species must once have been confined to their place of origin in some one of the continents now occupied by them so recently.

I may add that *Dicopus psyche*, which I recently described from Fiji, has subsequently been found in North Queensland.

Meeting of November 7, 1912.

The 262d regular meeting of the Society was entertained by Prof. T. B. Symons and Mr. A. B. Gahan at the Saengerbund Hall, 314 C Street N. W., on the evening of November 7, 1912, and there were present: Messrs. Baker, Barber, Burgess, Busck, Caudell, Cory, Craighead, Crawford, Cushman, Duckett, Fisher, Gahan, Gill, Green, Heidemann, Heinrick, Hopkins, Howard, Johansen, Knab, McAtee, Marshall, Middleton, Myers, Quaintance, Rohwer, Russell, Sanford, Sasscer, Schwarz, Siegler, Snyder, Symons, Walton, and Wood, members and C. C. Craft, J. R. Malloch, and R. C. Shannon, visitors.

The following proposed at the 261st meeting of the Society were elected active members: C. T. Greene, Carl Heinrick, J. D. Hood, F. Johansen, and W. Middleton. In addition the following names were proposed for active membership: F. C. Craighead, A. B. Duckett, and W. S. Fisher. Under suspension of rules, the three were elected.

Under new business the Recording Secretary read the following proposed amendments to the constitution:

Article IV to be amended to read as follows:

The officers of the Society shall be a President, a First Vice-President, a Second Vice-President, a Recording Secretary, a Corresponding Secretary-Treasurer, and an Editor, to be elected by ballot at the annual meeting. There shall be an Executive Committee consisting of the officers of the Society and three members to be elected by the Society in the same manner and at the same time.

Article V to be amended as follows:

Section 4. The Editor shall edit the magazine published by the Society under the direction of the Executive Committee.